

## DISTRIBUTION, HOSTS AND PEST STATUS OF THE ORCHID BEETLE *STETHOPACHYS FORMOSA* BALY (COLEOPTERA: CHRYSOMELIDAE)

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### Abstract

The orchid beetle *Stethopachys formosa* occurs in the eastern areas of New South Wales and Queensland and also in the Northern Territory. Surveys of orchid growers and by the authors from 1990 to 1992 recorded *S. formosa* feeding on 27 species of orchids incorporating 67 varieties. Orchids were the only hosts, most commonly *Dendrobium* spp. Most orchid growers rated *S. formosa* as a minor pest of orchids, but a third considered it to be a major pest.

### Introduction

The indigenous orchid beetle *Stethopachys formosa* attacks wild orchids (Fitzgerald 1892) and has become a pest of cultivated orchids grown outdoors (Smith 1940, Rushton 1980, Hawkeswood 1991). Both adults and larvae feed on inflorescences and seed pods and also on young leaves and growing points. Despite its importance to orchid growers, its pest status has never been accurately determined in terms of location and frequency of attack. The most comprehensive host list provided to date (Hawkeswood 1991) included 16 orchid taxa but observations by the authors indicated that this was incomplete.

This paper reports studies aimed at extending knowledge of the host range and regional pest status of *S. formosa*.

### Methods

Data on the host range, pest status and seasonal incidence of *S. formosa* were obtained by direct field observations from 1990 to 1992. These data were compiled by the authors during regular sampling at sites in south Queensland (Gough and Montgomery 1992) and in a survey along coastal Queensland.

These observations were supplemented by reports from orchid growers contacted during the surveys and by responses to a questionnaire published in an orchid industry journal. The questionnaire required respondents to classify the pest status as nil, minor or major; the frequency of attack as nil, rare, sporadic or common, and to specify the orchid types attacked. A total of 122 responses were received from around Australia, all but a few of which were from orchid growers.

Label data were also obtained from specimens of *S. formosa* held in the following museums: Australian Museum, Sydney (AMS); Australian National Insect Collection, Canberra (ANIC); Department of Primary Industries and Fisheries, Berrimah, Northern Territory (DPIF); Museum of

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Victoria, Melbourne (MVM); Queensland Department of Primary Industries, Brisbane (QDPI); Queensland Department of Primary Industries, Mareeba (QDPM); Queensland Museum, Brisbane (QMB); South Australian Museum, Adelaide (SAM); West Australian Museum, Perth (WAM).

### Distribution

Our field work and information from respondents showed that *S. formosa* is present from Ulladulla in New South Wales to Mareeba in northern Queensland (Table 1). *S. formosa* was not reported by respondents from Victoria (8), South Australia (1), Tasmania (1) or Western Australia (2). Additional museum specimen records and published distribution records are as follows: NEW SOUTH WALES: Bawley Point (ANIC); Blaxland (ANIC); Coffs Harbour (ANIC); Cungewai Valley near Cessnock (AMS); Richmond River (ANIC and AMS); Upper Landsdowne via Taree (AMS); QUEENSLAND: Braemar State Forest via Kogan (QMB) Brisbane (QDPI and ANIC); Cairns (ANIC); Cape York (QMB); Condamine (AMS); Eidsvold (ANIC); Kroombit Tops (Lower Dry Creek) (QMB); Mareeba (QDPM); Maryborough (ANIC); 7 km W of Paluma (ANIC); Mt. Walsh near Biggenden (ANIC); Mt Moffatt National Park, Parada (QDPM); Peawaddy Gorge (QMB) Pinalba (ANIC); Rockhampton (ANIC), Sinclair Bay near Bowen (ANIC); Toowoomba (ANIC). NORTHERN TERRITORY: Darwin (SAM and DPIF); Ludmilla (DPIF); Smith Point (DPIF) Stuart Highway 37 km S of Darwin (DPIF). The total known distribution of *S. formosa* is the coastal plain of New South Wales north of Batemans Bay, Queensland east of the Dividing Range and the vicinity of Darwin, N.T.

**Table 1.** Locality guide from north to south. (1-23 Queensland, 24-32 New South Wales).

Locality	Lat/Long	Locality	Lat/Long
1 Mareeba	16°59'S 145°25'E	17 Tinana	25°45'S 152°41'E
2 Tolga	17°13'S 145°29'E	18 Woombye	26°40'S 152°58'E
3 Atherton	17°16'S 145°29'E	19 Caloundra	26°48'S 153°08'E
4 Jaggan	17°24'S 145°36'E	20 Caboolture	27°05'S 152°57'E
5 Goondi	17°30'S 146°01'E	21 Brisbane	27°28'S 153°01'E
6 Mission Beach	17°53'S 146°06'E	22 Toowoomba	27°34'S 151°57'E
7 Tully	17°56'S 145°56'E	23 Nerang	28°00'S 153°20'E
8 Cardwell	18°16'S 146°01'E	24 Wardell	28°57'S 153°28'E
9 Ingham	18°39'S 146°10'E	25 Werrington	33°45'S 150°45'E
10 Bluewater	19°11'S 146°33'E	26 Lindfield	33°47'S 151°10'E
11 Mackay	21°09'S 149°11'E	27 Harbord	33°47'S 151°17'E
12 Eungella	21°10'S 148°24'E	28 Sydney	33°53'S 151°13'E
13 Airlie Beach	20°16'S 148°53'E	29 Caringbah	34°02'S 151°08'E
14 Sarina	21°26'S 149°13'E	30 Loftus	34°03'S 151°03'E
15 Yeppoon	23°08'S 150°44'E	31 Nowra	34°53'S 150°36'E
16 Rockhampton	23°22'S 150°32'E	32 Ulladulla	35°21'S 150°29'E

**Host range**

A total of 27 species and 67 varieties of orchid were reported by respondents and in our survey (Table 2). This is a major increase in the number of orchid hosts previously listed (Hawkeswood 1991). *S. formosa* appears to feed and breed only on orchids. Records of other hosts by our respondents were checked and found to be due to confusion with another native chrysomelid, the pumpkin beetle *Aulacophora hilaris* (Boisduval).

**Table 2.** Species of orchids attacked by *S. formosa* and the localities of these records. See Table 1 for locality details.

Orchid species, varieties	Locality No.
* <i>Arachnis</i> sp.	5, 6
* <i>Arundina graminifolia</i> (D. Don) Hochr.	1, 3, 4
<i>Bulbophyllum baileyi</i> F. Muell.	10
<i>Bowringana</i> sp.	3
* <i>Cadetia taylori</i> (F. Muell.) Schltr.	
<i>Calanthe</i> sp.	3
<i>Cattleya</i> sp.	1, 16, 22
* <i>Cymbidium canaliculatum</i> R. Br.	1, 11, 21
* <i>Cymbidium madidum</i> Lindl.	3, 21
<i>Cymbidium suave</i> R. Br.	21, 25, 27
<i>Cymbidium</i> hybrids	19, 22, 27, 32
<i>Dendrobium</i> hybrids	22, 31, 32
<i>Dendrobium adae</i> F. M. Bailey	
<i>Dendrobium aemulum</i> R. Br.	
* <i>Dendrobium agrostophyllum</i> F. Muell.	12, 28
* <i>Dendrobium bigibbum</i> Lindl.	1, 8, 16, 21
* <i>Dendrobium bowmanii</i> Benth.	17, 20
* <i>Dendrobium canaliculatum</i> R. Br.	3, 14, 19, 21
<i>Dendrobium cucumerinum</i> Macleay ex Lindl.	28
<i>Dendrobium</i> X <i>delicatum</i> F. M. Bailey	27, 28, 29
* <i>Dendrobium discolor</i> Lindl.	7, 15, 16, 21
<i>Dendrobium falcorostrum</i> Fitzg.	27, 28, 30
<i>Dendrobium fleckeri</i> Rupp and C. T. White	25
* <i>Dendrobium gracilicaule</i> F. Muell.	21, 25, 29
<i>Dendrobium</i> X <i>gracillimum</i> (Rupp) Leaney	7, 18, 28
<i>Dendrobium</i> 'Hilda Poxon'	26
<i>Dendrobium johannis</i> Rchb. f.	11
* <i>Dendrobium jonesii</i> Rendle	2, 7
* <i>Dendrobium kingianum</i> Bidwill ex Lindl.	13, 21, 27, 28
* <i>Dendrobium linguiforme</i> Sw.	
* <i>Dendrobium monophyllum</i> F. Muell.	
<i>Dendrobium racemosum</i> (Nichols) Clemesha and Dockrill	3

**Table 2 (cont.).** Species of orchids attacked by *S. formosa* and the localities of these records. See Table 1 for locality details.

Orchid species, varieties	Locality No.
<i>Dendrobium schoeninum</i> Lindley	
<i>Dendrobium smillieae</i> F. Muell.	7
<i>Dendrobium speciosum</i> Smith var. <i>speciosum</i>	28
* <i>Dendrobium speciosum</i> var. <i>curvicaule</i> (F.M. Bailey) D.P. Banks and Clemesha	
<i>Dendrobium speciosum</i> var. <i>hillii</i> (Mast.) D.P. Banks and Clemesha	21, 25, 27, 28
* <i>Dendrobium speciosum</i> var. <i>pedunculatum</i> (Clemesha) D.P. Banks and Clemesha	
<i>Dendrobium</i> soft cane hybrids	19
* <i>Dendrobium teretifolium</i> R. Br.	3, 12, 28
* <i>Dipodium elegantulum</i> D.L. Jones	
* <i>Dipodium ensifolium</i> F. Muell.	
<i>Dipodium variegatum</i> M.A. Clem and D.L. Jones	24
<i>Diurus</i> sp.	17
* <i>Diurus oporina</i> D.L. Jones	
<i>Epidendrum</i> sp.	16
<i>Epidendrum ibaguense</i> Kunth	29
* <i>Epidendrum X obrienianum</i> Rolfe	21, 28
<i>Epidendrum radicans</i> Pav. ex Lindl. and reed stem hybrids	18
* <i>Geodorum densiflorum</i> (Lam.) Schltr.	
<i>Laelia anceps</i> Lindley	18
<i>Microtis</i> sp.	12
<i>Miltonia</i> sp.	26
<i>Neobenthamia gracilis</i> Rolfe	17
<i>Oncidium</i> sp.	1
<i>Oncidium sphacelatum</i> Lindley	31
<i>Phalaenopsis</i> sp.	1
<i>Plectorrhiza tridentata</i> (Lindl.) Dockrill	23
<i>Renanthera</i> sp.	16
<i>Sarcochilus hartmanii</i> F. Muell.	23
<i>Sarcochilus falcatus</i> R. Br.	3
<i>Spathoglottis</i> sp.	9, 11
<i>Stanhopea</i> spp.	4
<i>Thelymitra venosa</i> R. Br.	17
<i>Vanda</i> strap leaf, terete, semi-terete	1, 3, 16, 21
* <i>Vanda</i> alliance	
<i>Vanda tricolor</i> Lindley	4, 21, 28

\* direct observation by authors during field work.

### Pest status

For those areas in which *S. formosa* was present, 56% of respondents considered it to be a minor pest but 34% rated it as major pest (Table 3). 41% rated it as common in frequency of occurrence and 36% rated it as sporadic, but there was considerable variation between regions. It was rated as common by 70% of growers in southern Queensland, by 50% in Sydney and 43% in northern Queensland. However in central Queensland only 27% rated it as common whilst 50% rated it as sporadic.

70% of respondents noted feeding on *Dendrobium* spp., 57% on *Vanda* spp., 29% on *Epidendrum* spp., 24% on *Cymbidium* spp. and 22% on *Cattleya* spp.. Museum specimens were recorded from *Dendrobium* spp. and *Cymbidium* spp.

**Table 3.** Pest status and frequency of attack (numbers of growers reporting each class) of *Stethopachys formosa* in Australia as reported by growers surveyed in 1992.

Region	Pest status			Frequency of attack on orchids				Total No. reports
	nil	minor	major	nil	rare	sporadic	common	
Qld - far north	2*	19	15	2*	3	15	15	36#
Qld - central	1	17	8	0	6	13	7	26
Qld - south	0	5	5	0	2	1	7	10
N.S.W. - north	3	6	3	1	3	4	4	12
N.S.W. - Sydney	4	7	5	2	3	3	8	16
N.S.W. - south	1	6	1	2	0	3	3	8
Total numbers	11	60	37	7	17	39	44	108
Percentage	10	56	34	7	16	36	41	-

\* orchids grown in shadehouses

# one questionnaire incomplete

### Control measures

Control measures involving cultural methods and the use of insecticides as appropriate have been recommended elsewhere (Gough and Montgomery 1992).

### Conclusion

We conclude that *S. formosa* is a pest of orchids throughout much of coastal and near coastal New South Wales and Queensland. It is a minor pest overall but to a third of growers it is a major pest. Depending on locality it is common or sporadic in frequency as a pest on a wide range of orchids, especially species of *Dendrobium*.

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